



WHAT IS CLAIMED IS:

1. A method for fabricating a semiconductor device, comprising:

preparing a stencil mask having a thin film portion with an opening and a support portion supporting the thin film portion;

irradiating a semiconductor substrate with a particle beam through the opening; and

controlling the particle beam, wherein the support portion is irradiated with a fringe portion of the particle beam.

2. A method for fabricating a semiconductor device, comprising:

preparing a stencil mask having a thin film portion with an opening, a support portion supporting the thin film portion and a beam structure portion supporting the thin film portion;

irradiating a semiconductor substrate with a particle beam through the opening; and

controlling the particle beam, wherein the support portion or the beam structure portion is irradiated with a fringe portion of the particle beam.

3. A method for fabricating a semiconductor device, comprising:

preparing a stencil mask having a thin film portion with an opening and a support portion supporting the thin film portion;

irradiating a semiconductor substrate with a particle beam through the opening; and

performing at least one process of beam irradiation, thermal annealing and chemical treatment to a region of the stencil mask, where is irradiated with the particle beam amount of which is smaller than that of the particle beam irradiating the other region of the stencil mask.

4. A method for fabricating a semiconductor device according to claim 1, further comprising, forming an alignment mark in the area of the thin film portion faced to the semiconductor substrate.

5. A method for fabricating a semiconductor device according to claim 1, wherein a part of the particle beam is selectively shielded by an aperture.

6. A method for fabricating a semiconductor device according to claim 1, further comprising;

measuring the position of the thin film portion or the supporting portion by a mask measurement device; and

feeding back the data measured by the mask measurement device to at least one of a particle beam source generating the particle beam, a scanner scanning the particle beam, and the aperture selectively shielding a part of the particle beam.

7. A method for fabricating a semiconductor device according to claim 1, wherein the dose of the particle beam is substantially uniform all over the irradiated region.

8. A method for fabricating a semiconductor device according to claim 4, wherein the alignment marks is a groove or an opening.

9. A method for fabricating a semiconductor device according to claim 1, wherein a plurality of the apertures is installed to shield a part of the particle beam.

10. A method for fabricating a semiconductor device according to claim 6, wherein the mask measurement device includes a laser displacement meter.

11. A method for fabricating a semiconductor device according to claim 6, wherein the mask measurement device measures the position of the thin film portion or the supporting portion by detecting graphic images.

12. A method for fabricating a semiconductor device according to claim 10, wherein mask measurement device measures the position of the thin film portion or the supporting portion by detecting graphic images.

13. An equipment for fabricating a semiconductor device, comprising:

a particle beam source generating a particle beam to irradiate a semiconductor substrate with the particle beam through an opening of a stencil mask, the stencil mask having a thin film portion with the opening and a support portion supporting the thin film portion;

a scanner scanning the particle beam;

a mask measurement device measuring a position of a thin film portion or a supporting portion; and

an arithmetic logic unit calculating the data measured by the mask measurement device and feeding back the results calculated with respect to at least one of the particle beam source and the scanner to control the region irradiated by the particle beam.

14. An equipment for fabricating a semiconductor device, comprising:

a particle beam source generating a particle beam to irradiate a semiconductor substrate with the particle beam through an opening of a stencil mask, the stencil mask having a thin film portion with the opening and a support portion supporting the thin film portion,

a scanner scanning the particle beam;

an aperture shielding a part of the particle beam;

a mask measurement device measuring a position of a thin film portion or a supporting portion;

an arithmetic logic unit calculating data measured by the mask measurement device and feeding back the data to at least one of the particle beam source, the scanner and the aperture to control the region to be irradiated by the particle beam.